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Western Norway
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BACHELOR'S THESIS

Self-care to Prevent Diabetic foot ulcers

Egenomsorg ved forebygging av
diabetiske fotsår

Candidate nr: 405
Bachelor of Nursing
Faculty of Health and Social Sciences

Submission Date: 22nd of May 2020

I confirm that the work is self-prepared and that references/source references to all sources used in the work are provided, cf. Regulation relating to academic studies and examinations at the Western Norway University of Applied Sciences (HVL), § 12-1.

Sammendrag

Bakgrunn: Diabetes er en sykdom som rammer mange mennesker både i Norge og internasjonalt. Diabetiske fotsår er en alvorlig komplikasjon av diabetes type 2 og kan føre til redusert livskvalitet, amputasjon og død. Sykepleiere må inneha kunnskap og ferdigheter om forebygging og behandling av fotsår for å hjelpe pasientene i å utføre egenomsorg.

Formål: Formålet med oppgaven er å undersøke hvordan sykepleiere kan bidra til å forebygge diabetiske fotsår ved å tilrettelegge for egenomsorg gjennom informasjonsarbeid.

Metode: Oppgaven er en litteraturstudie. I oppgaven ble fem kvantitative artikler inkludert, ingen av dem var eldre enn 10 år og alle var etisk godkjent av deres tilhørende helseinstitusjoners eller universitetets etiske komite og fagfellevurdert. Artiklene er kritisk vurdert og analysert.

Resultat: Hovedtemaene fra artiklene er kunnskap og utdanning, og motivasjon og holdning til egenomsorg av diabetesfoten. Etter analyse av alle fem artiklene er det åpenbart at pasientenes holdning til egenomsorg har lite relevans dersom de ikke innehar tilstrekkelig kunnskap til å gjennomføre egenomsorgen. Kunnskap er med andre ord en nødvendig første faktor for å sikre egenomsorg fra pasientens side.

Konklusjon: Konklusjonen er i tråd med Dorothea Orem sin teori om sykepleie som forebyggende arbeid hvor egenomsorg er i sentrum. Studiene viser at et fokus på forebyggende arbeid gjennom å inkludere to faktorer i samarbeidet med pasienten, gi riktig og nødvendig informasjon på en passende måte. Forebyggende egenomsorg resulterte med reduserte risikofaktorer for utvikling av diabetiske fotsår blant deltagerne i studiene som mottok kunnskapsbasert informasjon.

Nøkkelord: Hjemmesykepleie, Diabetes Mellitus type 2, diabetiske fotsår, forebygging, egenomsorg, kommunikasjon

Table of Contents

1.0 Introduction	4
1.1 Aim of thesis.....	5
1.2 Basis for choosing the topic and thesis	5
1.3 Thesis.....	5
1.4 Delimitation of the thesis.....	5
1.5 Definitions of terminology.....	6
1.6 Disposition.....	6
2. 0 Method:	7
2.1 Literature study as a method	7
2.2 Literature search process	8
2.3 Source criteria	9
2.4 Ethical deliberations.....	10
2.5 Analysis of the Articles	10
3.0 Theory	12
3.1 Preventative and Health Promoting Care	12
3.1.1 The Role of Nurses in Health Promotion and Preventative Care	13
3.2 Diabetes Mellitus type 2.....	14
3.3 Diabetic Foot Ulcers	15
3.3.1 Neuropathic Ulcers	16
3.3.2 Ischaemic Ulcers	18
3.3.3 Complications	18
3.4 Home Health Nursing.....	19
3.5 Dorothea Orem's Theory of Self-Care	19
3.6 Nurses responsibility to inform and communicate	20
3.6.1 Information	20
3.6.2 Communication	21
3.7 Documentation.....	21
4.0 Results	23
4.1 Knowledge.....	23
4.2 Information	24
4.3 Motivation and Attitude	24

4.4 Overall Assessment of the Results	25
5.0 Discussion	26
5.1 The Preventative Role of Nurses	26
5.2 Knowledge and Information	27
5.3 Motivation and attitude towards Self-Care	29
5.4 Discussion of the Method.....	30
5.5 The relevance of the thesis to the profession of nursing	31
6.0 Conclusion.....	33
7.0 References	34
8.0 Appendix.....	39
Diagram 1: Flow chart Exclusions of Articles	39
Table 1: PICO, MeSH terms and keywords.....	40
Table 2: Literature search Pubmed	40
Table 3: Literature search Cinahl	41
Table 4: Literature Information pp. 42-44	42
Table 5: Results pp. 45-46.....	45

1.0 Introduction

Diabetes is a widely spread disease in Norway and is the most common type of diabetes. Ten per cent of the population who are aged 70 and above are diagnosed with diabetes (NHI, 2014). Diabetes is a lifestyle disease, but one must also be genetically predisposed for it (Diabetesforbundet, 2016). The symptoms of Diabetes type 2 are very subtle and can be hard to notice. The symptoms can be tiredness and a sensation of thirst. Diabetes type 2 can be treated by changing to a healthier lifestyle, or medication and insulin if necessary (Helsedirektoratet, 2018).

Diabetes can lead to severe complications that can be acute or chronic. Acute problems consist of hyperglycaemia and hypoglycaemia and lead to a diabetes-induced coma (DiabetesUK, n. d.-a). Chronic complications include nephropathy, retinopathy, neuropathy, stroke, heart problems and foot problems. Many of these problems are caused by the destructive effect that poorly managed blood glucose levels have on the blood vessels of the body (IDF, 2020).

It is likely that 15% of all diabetes patients will have a diabetic foot ulcer throughout their life (NHI, 2020). A diabetic foot ulcer is a severe complication to diabetes; a sore most commonly found at the sole of the foot (APMA, n. d.). The ulcer is often caused by trauma, pressure or badly fitted shoes, and become problematic because of the neuropathy or decreased peripheral circulation that often accompanies diabetes type 2. This is due to damaged blood vessels mentioned above, a common complication of the disease. Diabetic foot ulcers are divided into categories where neuropathic ulcers and ischaemic ulcers are the two main groups (Foster & Edmonds, 2011).

A diabetic foot ulcer will inhibit daily functions, cause pain and often lead to amputations. In Norway there are approximately 400-500 amputations caused by diabetic foot ulcers per year (NHI, 2020). Because of the old age and other underlying diseases of the patients requiring amputations, the mortality rate for the surgical procedure is 10% (NHI, 2020).

Home health nursing is an arrangement by which patients receive necessary healthcare from qualified personnel in their own homes. This is an integrated part of the public health system. In 2014 there were 209 010 people in Norway which received home health nursing (Fjørtoft, 2019, p. 11), amounting to 4,1% of the population (SSB, 2020). Based on the statistics above it is likely to meet several patients with a diabetes diagnosis who receives home health nursing. These statistics, including the relatively high number of diabetes type 2-patients in Norway, make the prevention of complications from the disease an important goal from a public health perspective.

1.1 Aim of thesis

The aim of the thesis is to investigate how nurses can contribute in the prevention of diabetic foot ulcers when the patient is performing self-care.

1.2 Basis for choosing the topic and thesis

I have, during my work in different health institutions, come across several patients who had amputated a lower limb due to diabetic foot ulcers. Having seen the impact of the complication on the mental and physical wellbeing of patients. I hope to shed some light on the topic and its importance to reduce the risk of amputation in future diabetes-patients. As important as the topic of avoiding amputations of limbs are, the underlying issue is the foot ulcer. In addition to causing loss of limbs they can also cause pain and inability to function as usual. I have therefore chosen to focus on preventing foot ulcers. As mentioned above, the thesis is highly relevant because diabetes mellitus type 2 is a widely spread and common disease.

1.3 Thesis

What is the role of nurses in improving self-care for prevention of foot ulcers in patients with type 2 diabetes living in their own home?

1.4 Delimitation of the thesis

Diabetes mellitus type 2 is the most common type of diabetes. I have chosen this because the most research is done within this group of patients. I have also chosen to eliminate diabetes mellitus type 1 so that I can focus on one group of patients.

Patients receiving home health nursing are often elderly and vulnerable, and they represent a significant part of the Norwegian population. Because they live at home and do not have healthcare professionals around them all the time, they are in a greater need of information and self-care than patients living in institutions. This is why I have chosen this specific group of patients opposed to choosing a wider range of patients such as elderly or institutionalized patients. Nurses are responsible for the patients while they are still at home prior to potential surgery, as such I have focused on the preventative work.

1.5 Definitions of terminology

Diabetes Mellitus type 2: A chronic disease that affects the metabolization of blood glucose caused by insufficient production of insulin or because the body resists the effects of the insulin the body produces (Mayoclinic, 2019).

Diabetic foot ulcers: an open wound that is most commonly located on the bottom of the foot and can develop due to poor circulation, pressure, trauma or lack of sensation in the foot (APMA, n. d.).

Prevention: Preventative care or prophylaxis are the measures one takes to avoid diseases and can take the form of vaccinations, screenings or educational interventions.

Home health nursing: A healthcare service which is offered to all citizens in need of care for a period of time due to disease, age or other factors. This service is done in the patient's home and can be done by either a nurse or a different type of healthcare personnel (Fjørtoft, 2019, p. 17).

1.6 Disposition

The topic will firstly be introduced, thereafter the choice of method and the literature search process will be explained. Then there will be a theory part where there will be essential information about the relevant topics. I will then present the results from the search process and the discussion will come after. The thesis will end with a conclusion that will summarize and clarify the results and discussion.

2.0 Method:

I have chosen to write a literature study and the use of quantitative method research to gather information about the topic.

2.1 Literature study as a method

A literature study is used to systematically sort and gather knowledge from written sources (Thidemann, 2019). The purpose of this writing method is to provide an understanding of the material to the reader and enlighten them on how the results are reached (Thidemann, 2019, p. 80). I used the literature study to gather knowledge and information to build the basis for the thesis and to be able to discuss the topic with research-based knowledge. The process of a literature study consists of six steps; the formulation of a research question, the preparations to the literature search, the execution of the literature search, evaluation of the quality of the articles, the analysing of the articles and the compilation of the results (Thidemann, 2019, p. 80).

The articles I have included as results in this literature study are quantitative studies that provide the information in numbers, providing statistics and bringing out the representative answer within a greater group of participants (Dalland, 2019, p. 53). A quantitative questionnaire asks questions, which require a short answer and can be answered with multiple-choice answers. A qualitative study is often done through interviews and may ask a question with "How" and "Why" to gather a coherent understanding of the participants (Thidemann, 2019, p. 78).

The chosen research articles are based on quantitative studies to obtain a broad overview of the status within this area of nursing. I found that quantitative studies provided me with a neutral perspective on the information, the information itself is neatly categorized into tables and graphs, and easy to generalise. The lack of qualitative research may lead to a lesser understanding of the participants as one does not learn of the experiences, opinions and expectations of the participants through quantitative research.

2.2 Literature search process

The articles that were found for this thesis were identified by the use of structural searches in databases. To find the appropriate keywords to use in the search process a PICO table was created, which can be found in table 1 in the appendix. PICO is a tool that identifies keywords and simplifies the search process based on the thesis (Thidemann, 2019, p.83).

To retrieve articles, the keywords must be combined for use in the different databases. The database Pubmed is the most used database for health personnel and contains articles dating back to 1966 (Thidemann, 2019, p. 85). I also utilized the database Cinahl, which is a database containing articles for health professions including nursing. Cinahl contains articles from 1982 (Thidemann, 2019, p. 85).

MeSH terms used were; “Diabetes Mellitus type 2”, “Diabetic Foot”, “Foot Ulcer”, “Nursing”, “Aged” and “Self Care” and the keywords; “Prevention” and “Home care Nursing”. The search terms were used in combinations and the process on each search can be seen in the appendix in table 2 and 3.

My two searches resulted in 28 and 51 hits from where I began the process of excluding articles. I applied the filters peer reviewed, published between 2010 and 2020 and available in full-text, eight articles were duplicates so I was left with 40 results. Out of the articles there were left, I began evaluating the titles, in order to exclude articles that were irrelevant to the thesis. This excluded further 24 articles. I read through the 16 remaining articles by using the reading strategy that Thidemann (2019) has recommended, which is based upon targeted and strategic reading. Reading through the abstracts, an additional four articles were written in a language other than English or Norwegian and excluded, and one did not contain original research.

Six articles were excluded after reading the full text, as the focus or population did not fit the thesis. Three focused on medication, two on amputation and one included participants from tertiary care level. The process of excluding articles can be seen in the flow chart in diagram 1 in the appendix. A total of five articles remained after the process was completed.

2.3 Source criteria

Inclusion criteria:

- Peer reviewed journals
- Ethically approved
- Published in the last 10 years
- Original research
- Published in relevant journals
- Written in English or Norwegian

Exclusion criteria:

- Older than 10 years
- Tertiary care level
- Published in doctor's journals

By using certain criteria to delimitate articles, it becomes easier to find concrete relevant articles to use in the research process (Thidemann, 2019, p. 84). The first criteria I had was that the studies should be no more than ten years old, to find the most up to date, while also not excluding relevant articles. The oldest article used was published in 2013, so all articles met that criteria. The second was that all the studies had to meet the standards of being ethically approved. This is important in regard to the physical and psychological well-being for the participants of the study. All five of the articles were approved by an ethics committee. All of the articles were peer-reviewed, meaning that they were read, evaluated and approved by other scientists prior to publication.

The information gathered from the articles are applicable to the thesis. The articles all follow the IMRaD structure that corresponds to the research process within the field of health sciences. IMRaD structured articles contain Introduction, Method, Results and Discussion parts and are often necessary for an article to be approved by a journal (Thidemann, 2019, p. 68). An article with an IMRaD structure has a simple layout which allows for quick reading and navigation within the article.

The articles were published in medical journals and written by health professionals. The journals in which the articles were published in are Canadian Journal of Diabetes, Diabetes

Research and Clinical Practice and Revista Gaúcha de Enfermagem. The Canadian Journal of Diabetes is a diabetes-oriented and peer-reviewed journal, open to submission for all health-care professionals (CJD, n. d.). The Diabetes Research and Clinical Practice journal is an international journal for all health-care workers. The journal publishes original articles related to diabetes research and patient care (DRCP, n. d.). The Revista Gaúcha de Enfermagem is published in Brazil by a nursing school. The journal publishes scientific articles relevant for both national nursing in Brazil and international nursing (RGE, n. d.).

2.4 Ethical deliberations

When performing a study, one must ensure that all participants are attended to. Ethical deliberations are described by Dalland (2019, p. 235) to be the thought process of what ethical ramifications the work might possibly have, not simply following the rules or guidelines. Research ethical norms are used to evaluate all aspects of the research in light of societal norms and values, some of which are laws, and some of which are guidelines (HVL, 2016, §2). There are committees to approve research and to offer help and guidance where it is needed (Dalland, 2019, p.236). The Committees shall contribute to a good culture within research ethics and prevent violations of the norms (HVL, 2016, §3). The Declaration of Helsinki describes an ethical constitution that is valid for all research on humans and was declared by the World Medical Association. The declaration was created to ensure the observance of patient's rights, consent and complicity, as well as safeguarding patient's health and well-being (WMA, 2018). All research must be approved by a research ethics committee prior to the start of the research, and the committee can also monitor the studies while they are being conducted. The study must also be approved after completion (WMA, 2018).

2.5 Analysis of the Articles

The articles were thoroughly read searching for themes that would contribute to the thesis. When reading all articles, three themes were found repeated in all five articles, and these were identified as "knowledge", "information" and "attitude and motivation". To analyse the articles, I colour-coded the text in three different colours, one for each theme, to separate the information in a comprehensive manner as recommended by Thidemann (2019). I gathered the information from the different categories in order to gain insight in the themes

from all five articles. The color-coding helped to draw conclusions and correlations between the research articles and aided in producing a more coherent result.

3.0 Theory

In the theory part I will give a brief introduction to topics that are relevant to the thesis, and topics that will be used throughout the discussion part of the thesis. Firstly, I will introduce the relevance of the thesis to the nursing profession, thereafter an introduction to the disease Diabetes mellitus type 2 thereafter, diabetic foot ulcers and their different categories; ischaemic and neuropathic ulcers and their complications. Other relevant topics are the theory of Dorothea Orem, relevant laws and guidelines, documentation and the nurse's responsibility to inform and educate the patients.

3.1 Preventative and Health Promoting Care

This type of healthcare is about working against the problem or disease before it appears. WHO (n. d.) defines health promotion as "the process of enabling people to increase their control over and improve their health". The primary phase of preventative work is about distributing information to the patient or citizen. Thereafter follows preventative routine designed to avoid health problems that are likely to develop before they do so, for example a diabetic foot ulcer. If control is not gained by pre-emptively establishing self-care routines, one is left with treating the problem or disease that now exists or prevent a relapse of the disease or problem (Mæland, 2010).

Health promotion is all work that is done to improve one's health. This includes the factors in life that one is in control over, and influences the health including behavioural risk factors (Grimsbø, Kristoffersen, Nortvedt, & Skaug, 2016). Lifestyle choices including diet, physical activity and obesity are addressed and advised against (E. WHO, n. d.). Health promoting work is to help the patient help himself/herself, and this can be done by providing proper knowledge so that the patient is equipped to perform self-care. The objective of health promoting work is to better the well-being of the people and increase the empowerment (Bjerva et al., 2006, p. 36). Empowerment is the strengthening of the patients' resources and gives the patients the necessary resources to take control of one's own disease and life (Grimsbø et al., 2016).

Health preventative work is all work to prevent diseases, risk factors and problems from occurring or developing (E. WHO, n. d.). The preventative work is based on the elimination of risk factors, and one must identify the risk factors before one can insert measures to avoid them. Informing the patient of risk factors and how to avoid them is essential in disease prevention and can be done through consultations. Another measure can be regular health checks to discover problems or diseases early. The ideal outcome of preventative work is to ensure the well-being and good health of a population (Bjerva et al., 2006, p. 39).

3.1.1 The Role of Nurses in Health Promotion and Preventative Care

Both preventative care and health promotion is essential in working as a nurse. This type of work is incorporated in all the work nurses do. It can be focusing the work on strengthening the patient's resources, providing information to the patient or checking for risk factors of the disease or within the patient's home (Fjørtoft, 2019, p. 69).

The Norwegian "The Ethical Guidelines for Nurses" contains guidelines as to how to perform nursing work in an ethically responsible way. The second part revolves around the patient, "2.1 The nurse has responsibility for a nursing practice that promotes health and prevents illness" (NSF, 2001). It is cost- and time-efficient, and extremely beneficial for the patient to prevent an ulcer which might have led to a surgical procedure, had it not been prevented.

The Norwegian Federation of Nurses (NSF) describes health promotion and preventative nursing as a cornerstone within the work of nurses and says: "Nurses shall promote health, prevent diseases, restore health, relieve pain and provide care". According to the NSF, health promoting and preventative care is a central aspect of nursing and the most important factor in maintain good health in the years to come. This is based on lifestyle- and age- related diseases like diabetes type 2 or COPD (NSF, 2011).

An integrative review on nurses' roles in health promotion practices revealed that nursing is an appropriate profession for health promotion. Nurses are considered general health

promoters, helping individuals to make health decisions based on knowledge and information. Empowerment is another tool, and a central part of the health promoting work for nurses. The studies showed that nurses did not know of declarations and health policy documents that health promotional work should be based upon (Kemppainen, Tossavainen, & Turunen, 2012).

3.2 Diabetes Mellitus type 2

In Norway approximately 4% of the population have diabetes, and out of these 90% have diabetes type 2 (Diabetesforbundet, 2016). Diabetes type 2 is a disease that is both a lifestyle disease, but one must also be genetically disposed for it (Diabetesforbundet, 2016). It is a chronic disease where the body produces insufficient amounts of insulin or the insulin is not efficient enough to maintain a regular blood glucose level (NHI, 2014).

Diabetes type 2 is most commonly found amongst elderly patients, and is more common in men than in women, where men between the ages of 35-54 are twice as likely to develop the disease compared to women in the same age range (Simmons, 2019). Lifestyle is an important factor that can cause diabetes type 2. Lifestyle choices affect how the body reacts to the insulin where a person that is inactive and overweight is more likely to develop diabetes type 2. Unhealthy eating that lacks in fibre and includes high-fat foods accompanied by lack of exercise are leading causes to both diabetes type 2 and obesity (Leontis & Hess-Fischl, 2018).

If diabetes is left untreated or the disease is poorly managed it can cause severe complications, possibly affecting major organs. The complications can both be chronic and acute. Acute problems include hypoglycaemia and hyperglycaemia (DiabetesUK, n. d.-a). Hyperglycaemia and dehydration can cause Hyperosmolar Hyperglycaemic State in patients with diabetes type 2 which is a potentially life-threatening condition requiring hospitalization. The condition can lead to loss of consciousness and can be reversed by rehydration and lowering the blood glucose (DiabetesUK, n. d.-b).

Chronic complications are long-term complications, such as retinopathy, nephropathy, neuropathy, foot problems, heart problems, stroke, gum disease and sexual problems. In most developed countries diabetes is the leading cause of major diseases like cardiovascular disease, kidney failure and lower limb amputations is diabetes (IDF, 2020).

High blood glucose levels over a sustained period of time can cause damage to the blood vessels. If there are problems with the blood vessels, blood cannot travel properly and can cause severe and fatal problems elsewhere in the body. Reduced function of blood vessels in the kidney can lead to end stage kidney disease, in the brain can lead to stroke and in the eyes can lead to loss of vision or blindness (DiabetesUK, n. d.-a). If blood vessels around the heart are damaged, it can cause coronary artery disease leading to a heart attack, and if the blood vessels that supply blood to the nerves are damaged it will cause neuropathy (IDF, 2020). When one part of the body is damaged or affected, one is more likely to develop problems in other organs.

Symptoms tend to develop over a longer period of time, and diabetes type 2 can therefore be hard to diagnose based on symptoms. The most common symptoms for diabetes type 2 are tiredness and an elevated sensation of thirst (Helsedirektoratet, 2018). The best treatment for this type of diabetes is healthy eating and regular exercise. If this is insufficient, blood regulating medication and insulin can be used (Helsedirektoratet, 2018).

3.3 Diabetic Foot Ulcers

The Norwegian association of Diabetes claims that foot ulcerations are the gravest complication to diabetes, also requiring a significant amount of resources to treat. A diabetic foot ulcer is described as an ulcer below the ankle that is caused by decreased peripheral circulation or neuropathy. The ulcer is an open wound, often located at the bottom of the foot and is most usually a pressure ulcer (APMA, n. d.). The "Simple Staging

System” categorizes the foot into six stages from one to six; the normal foot, the high-risk foot, the ulcerated foot, the infected foot, the necrotic foot and the unsalvageable foot (Foster & Edmonds, 2011, p. xii).

Common causes for diabetic foot ulcers are badly fitted shoes, or shoes that are broken, lack of or improper nail care or pressure or trauma to the foot (APMA, n. d.). Seven to ten per cent of all persons diagnosed with diabetes will have a foot ulcer sometime during their lives (Hofstad, 2019). The preventative work for diabetic foot ulcer should start once the patient receives the diagnosis of diabetes. Patients should be examined at least once a year by a primary physician but more often if the foot is at risk or if the patient has previously had ulcers. Approximately only one third of patients receive the regular one-year check-up (Hofstad, 2019). The Norwegian health Directorate has developed guidelines that include advice concerning how to treat and care for one’s own feet, which can be useful to inform the patient of and use as health personnel to gain information regarding how to help the patient (Helsedirektoratet, 2016).

Diabetic foot ulcer patients can be categorized into four groups; neuropaths, ischaemics, Charcot osteoarthropathies and renal impairments (Foster & Edmonds, 2011, p. 1). An introduction to the two main groups neuropaths and ischaemics will be given below.

3.3.1 Neuropathic Ulcers

The ulcer is often caused due to damage to the peripheral nerves amongst patients with diabetes. The usual characteristics for neuropathy are loss of sensation and pain.

Neuropathy is classified in three main types of nerves; autonomic nerves, sensory nerves and motor nerves. Autonomic nerves regulate daily nonconscious movement like food digestion, and gland functions, neuropathy in which can lead to dry and cracked skin.

Sensory nerves transmit information as temperature and pain and neuropathy can lead to loss of these sensations. Motor nerves control conscious movement like walking and muscle contractions and neuropathy in these can cause muscle weakness and cramps (NINDS, 2018).

Nerve damage in the extremities like the feet is called peripheral neuropathy and causes loss of sensation or constant pain in the areas affected. Peripheral neuropathy is the type of neuropathy most common in patients with diabetes (Rosenberger, Blechschmidt, Timmerman, Wolff, & Treede, 2020). Neuropathy can potentially be extremely dangerous to the diabetic patient as the loss of sensation in the feet can lead to unnoticed injuries that can cause infections (IDF, 2020).

Neuropathic ulcers can be caused because the patient group is often frail and vulnerable and therefore very susceptible to infections. This state is caused by neuropathy which can affect the gastrointestinal, cardiovascular and urogenital systems and therefore leave the patient in a vulnerable position. These patients are extremely susceptible to traumatic damage in the foot that causes breaks in the skin and therefore possible debilitating infections. This kind of ulcers often develop rapidly due to the prior state of the patient. Neuropathic ulcers can cause rapidly destructive infections both on the foot and elsewhere in the body (Foster & Edmonds, 2011, p. 2).

The neuropathic ulcer can seemingly develop very quickly despite the seemingly good prior state of the foot. The foot often has good pulse and is visibly in good shape prior to the ulcers, and therefore the development of the ulcer is unexpected. The pulse will often remain normal and the ulcer is generally painless. An infected neuropathic ulcer will not always cause fever and only minor discomfort to the patient. If the ulcer is not seen it is difficult to notice as it often brings none or minor symptoms apart from the ulcer itself. Therefore regular foot check-ups is important (WOUNDSource, 2020). Out of the four different categories of patients, the neuropathic patients are the ones with the best outcomes (Foster & Edmonds, 2011, p. 1). If a patient with neuropathy lives long enough, they almost always develop ischemia (Foster & Edmonds, 2011, p. 3).

3.3.2 Ischaemic Ulcers

Ischaemic patients have reduced peripheral circulation, which can cause missing peripheral pulse, cold and thin skin, pain both while walking and resting and discolouration of the skin. If the patient also has neuropathy, often referred to as “neuroischaemic”, the symptoms are subtle. The sensation of pain can be weakened and therefore regular inspection of the feet is essential (Foster & Edmonds, 2011, p. 84). Circulatory diseases like hypertension and hyperlipidaemia can worsen the circulatory condition for the ischaemic patient.

It is important to always treat proximal ischemia first as it will improve the distal flow (Foster & Edmonds, 2011, p. 83). These patients need long term care and follow-up which includes life-long commitment routine preventative foot care, in order to catch problems early. The diabetes patients with ischemia are often undertreated which is one explanation for the high mortality rate in this patient group. Ischaemic patients with infections have the worst prognosis out of the different diabetes ulcer types, including the highest amputation and mortality rate (Foster & Edmonds, 2011, p. 84).

3.3.3 Complications

The greatest risk to patients with diabetic foot ulcers are infections. The worsened circulation reduces the immune system, causing an increased susceptibility to infections. When a patient with diabetes incurs an infection, it causes the blood glucose levels to rise, creating perfect conditions for bacteria colonies to grow. Infections will destroy the foot if not taken care of, leading to partial or complete amputations, and possibly death. There is a much higher amputation rate for ischaemic patients over a 5-year period of time (29%) compared to neuropathic patients (11%) (Moulik, Mtonga, & Gill, 2003). Diabetes patients with foot ulcers has a 40% higher mortality rate than diabetes patients without foot ulcers (Feiring, 2010).

3.4 Home Health Nursing

Home health nursing is the service of healthcare in each of the individuals own place of living. It is a service that is provided to all citizens when they are in need of care for a period of time due to disease, age or other factors. This service can be provided by either a nurse or a different type of qualified healthcare personnel (Fjørtoft, 2019, p. 17). There are no limits as regards age or type of disease. It is simply a service offered to all individuals that are in need of healthcare at home. The goal of this type of healthcare is enabling individuals to stay in their own homes for as long as it is securely possible and desirable for the individuals involved (Fjørtoft, 2019, p. 17). It shall also contribute to strengthen the patient's resources and compensate for any lack of resourced if needed (Fjørtoft, 2019, p. 65).

3.5 Dorothea Orem's Theory of Self-Care

Dorothea Orem was an American nursing theorist and the person behind the self-care deficit theory. The first time she presented the theory was in 1971 and it is based upon Orem's conception of the responsibilities of nurses in the workplace (Kirkevold, 1998, p. 128).

Orem based her work on three questions; "What do nurses do and what should nurses do as practitioners of nursing? Why do nurses do what they do? What are the results from what nurses do as practitioners of nursing?", and the quest to find the answers is what led Orem to her theory of self-care. According to Orem, nursing is when a nurse performs actions to help someone with a target to achieve the best possible results. Orem classifies the functions of nurses in five different categories; "Acting for and doing for others, guiding others, supporting another, providing an environment promoting personal development in relation to meet future demands and teaching another". Categories 2-5 describe tools used for self-care, while category 1 is used when the patient is unable to perform self-care (Cavanagh, 2001).

According to Orem, a balance between self-care requisite and self-care capacity is the ideal picture of good health and this is central to her perspective on patient care. The self-care requisites are actions one must meet to cover the needs for self-care to promote the human functions, development, health and well-being (Orem, 1995, p. 189). The patient's self-care capacity is the ability to fulfil the self-care requisites. The needs and capacity can vary based on age, disease, trauma or other factors that affects the health. Orem emphasizes health preventative work as a central part in her model. She classifies fulfilling the self-care requisites as health promoting work and focuses nursing on health rather than disease (Cavanagh, 2001).

3.6 Nurses responsibility to inform and communicate

3.6.1 Information

The Norwegian Patient's Rights Act "pasient- og brukerrettighetsloven" § 3-2 (1999) says that one has the right to know the information that is required to have insight in one's own health condition and the health care that is given to one. In addition to this being a right, it is also a right the patient should receive without having to ask for. The relationship between a caregiver and a patient should be based upon trust and openness to be able to have a well-functioning partnership.

An important tool in health promoting nursing is teaching and guidance of the patient and relatives (Fjørtoft, 2019, p. 24). Helping the patient understand their illness is a significant step to help them perform self-care. Proper information can also increase the patient's feeling of safety within their own home and might make them feel able to take control of their diagnosis (Fjørtoft, 2019, p. 123). The patient may need help with understanding the disease or how to live with it. Within these categories there are a lot of information and one must discuss with the patient to find out what they need to know. It might also require bringing in other health professions like nutritionists or physiotherapist if the patient's information needs require it (Fjørtoft, 2019, p. 123).

To be able to utilize Orem's theory of self-care, the patient must be in possession of a sufficient level of information, both on the disease and how to live with it. In order for the patient to feel safe and comfortable with performing their own care, they need to be able to trust themselves. Trust in the provider of health care and information is fundamental in creating the needed confidence for the patient. This can be based upon good relations amongst provider and receiver, and the knowledge that the provider is an expert and is able to pass along the required information (Fjørtoft, 2019, p. 123).

3.6.2 Communication

Communication is the greatest tool a nurse has to build trust with the patients. Good communication is based on ethical values and empathy (Fjørtoft, 2019, p. 179). Non-verbal communication is equally as important as verbal communication. This can be a smile, a correctly timed silence or a touch and can mean just as much, if not more to the patient as what words can mean (Eide & Eide, 2017, p. 198).

Professional communication must be focused and be done with a purpose. Sometimes this is done to provide information, other times this is to bring the patient comfort (Fjørtoft, 2019, p. 179). When performing professional communication, one must be conscious of words and their meaning. The communication should be of help to the patient, and the patient's situation and needs must be taken into consideration (Eide & Eide, 2017, p. 18).

3.7 Documentation

Proper documentation is important when different healthcare institutions work together with the same patient. If the hospital leaves out information, for example medication changes, before the patient is discharged. It can lead to the patient receiving the wrong medication, with possibly lethal consequences. This can also be a problem within the same organization where caregivers do not provide adequate documentation and it can create problems both for the patient and for the institution.

Quality care and continuity within home health nursing is based on documentation (Fjørtoft, 2019, p. 184). Proper documentation will give an overview of the setting and will further the ability to perform good health care when the patient meets a large amount of healthcare workers from day to day (Fjørtoft, 2019, p. 184). The documentation should be concise enough so that all healthcare providers can understand the evaluations and measures that have been taken (Fjørtoft, 2019, p. 188).

Documentation is not only essential for the functioning of the care, but is also a statutory requirement. One must be able to prove the course of actions through documentation where it can be used as evidence if needed (Fjørtoft, 2019, p. 184). The obligation to document recurs in several of the Norwegian acts, which will be mentioned in 3.9 Laws, Principles and Ethics.

4.0 Results

Below, I will present the five research articles that provides the foundation for the thesis, and the information from the articles will be used in the discussion. A table including information about the articles can be found in table 4 and 5 in the appendix.

The main themes from the articles are knowledge and education, and motivation and attitude towards self-care of the diabetic foot. After analysis of all five articles, it is clear that the attitude towards self-care has little significance if the patient does not have sufficient knowledge to be able to perform self-care of the diabetic foot. The participants in the studies appeared motivated to take care of themselves, but they were lacking the knowledge to do so. Providing sufficient knowledge and education is the most important component when approaching the topic of self-care.

4.1 Knowledge

In order to perform adequate self-care of the diabetic foot one must possess the knowledge of how to do so. A low level of knowledge is a risk factor for developing foot complications (Ramirez-Perdomo, Perdomo-Romero, & Rodriguez-Vélez, 2019) and can be associated with a low level of education (Scain, Franzen, & Hirakataba, 2018). A patient with a low level of education has a lesser ability to understand and process the disease, which in turn negatively impacts the quality of life (Ramirez-Perdomo et al., 2019). Insufficient prior knowledge lead to incorrect foot-care behaviour (Policarpo et al., 2014) and the improvement of this knowledge caused an increase in their confidence in performing self-care (Nguyen, Edwards, Do, & Finlayson, 2019). Correspondingly, the less knowledge a participant had, the less likely he was to perform foot self-care (Ramirez-Perdomo et al., 2019). The patients who had prior basic knowledge of diabetic and foot self-care were shown to improve preventative foot-care behaviour when exposed to an educational intervention (Nguyen et al., 2019). The patients who received knowledge on how to perform foot self-care had a reduced risk of developing risk factors of diabetic foot ulcers compared to participants that did not receive such information (Fan, Sidani, Cooper-Braithwaite, & Metcalfe, 2013). Patients who gained knowledge about diabetes and foot-care had a

broader understanding of the disease and were more willing to perform foot self-care. They did this with an increased confidence, decreasing the risk factors of developing foot complications (Fan et al., 2013, Nguyen et al., 2019, Scain et al., 2018).

4.2 Information

Information about disease, prevention and health care should be provided by professional health workers such as nurses to enable active attitudes in relation to the disease (Policarpo et al., 2014). Written material did not provide enough information when tested against educational interventions (Nguyen et al., 2019), and proper dialogue is needed to be aware of whether the patient has understood the information that was given (Policarpo et al., 2014). One-on-one dialogues are to be preferred when communicating important information (Fan et al., 2013), and educational material should be repeated to clarify possible doubts (Scain et al., 2018). Insufficient communication and educational interventions from nurses negatively influence the level of knowledge in patients (Ramirez-Perdomo et al., 2019). The information provided by nurses should be targeted to improve knowledge, skills and attitude towards foot hygiene (Scain et al., 2018). When receiving proper information through educational interventions, the self-care behaviour improved significantly (Nguyen et al., 2019) and it caused a change of attitude (Scain et al., 2018). Proper information from professional health workers is essential when providing the patients with knowledge-based information on the disease (Scain et al., 2018). One-on-one dialogues, follow-up appointments and the avoidance of the use of only written material can help the patients to understand the disease and the prevention of complications (Fan et al., 2013, Nguyen et al., 2019). The patients need to understand the material to be able to perform the self-care. Without this understanding, the motivation and attitude to perform self-care is irrelevant (Policarpo et al., 2014).

4.3 Motivation and Attitude

Patients must have motivation and a positive attitude, in order to efficiently incorporate a self-care regime into their daily routine (Policarpo et al., 2014). The overall response to the educational interventions were good, and the participants were willing to follow the guidelines to prevent foot ulcers. Instances of inadequate self-care despite positive attitude suggested that the participants had a deficiency of previous knowledge (Policarpo et al.,

2014). In order to change the behaviour of participants and encourage self-care, educational interventions were used (Scain et al., 2018). Four out of five participants said they would engage in self-care foot practices to prevent complications if sufficient information was provided (Policarpo et al., 2014). The attitude toward self-care improved amongst the participants in the intervention group, after receiving educational interventions (Nguyen et al., 2019). The participants were possibly more likely to accept and take part in interventions if they had previously been exposed to these, and they were also more willing to change their habits (Scain et al., 2018). In addition, women were found more likely to include foot-care into their daily routine (Ramirez-Perdomo et al., 2019). The participants were willing to use the intervention as a method to prevent foot problems and felt that it was beneficial (Fan et al., 2013). Most of the participants wished to be able to take care of themselves but were lacking the knowledge of how to do so properly (Nguyen et al., 2019, Policarpo et al., 2014). Many of those who did not share the positive attitude, changed their mind after being exposed to educational interventions (Nguyen et al., 2019, Scain et al., 2018). Educational interventions provide both knowledge to the participants, and motivates them to perform preventative foot-care (Fan et al., 2013, Nguyen et al., 2019, Scain et al., 2018).

4.4 Overall Assessment of the Results

All the studies confirm that proper information and educational interventions are key in the prevention of diabetic foot ulcers. Overall, the five articles show that patients do not have sufficient information about diabetes, the diabetic foot and the care of it. Some patients stated that the information that they had received from healthcare workers was insufficient. Proper information is needed to understand the consequences and improve the self-care within this group of patients. Professional healthcare workers such as nurses should deliver this information and be available if the patient has questions or doubts concerning the assisted care or self-care of the diabetic foot.

5.0 Discussion

The discussion will be based on the theory and studies previously explained.

I have chosen to utilize Dorothea Orem's theory of self-care, as it provides the theoretical foundation for this thesis and its findings. The most important step to better health amongst home-based patients is the information they need in order to care for themselves. This patient group is not surrounded by healthcare workers continuously and it is important for them to know how to take care of themselves when needed. Information, knowledge and the right attitude is essential in self-care and must be taught to the patients who are in need of it.

5.1 The Preventative Role of Nurses

The preventative care of the diabetic foot starts when the diagnosis of diabetes is set (Hofstad, 2019). Orem describes being a nurse as not only to focus on the sick, but to focus on the healthy, and emphasizes health preventative work as a central part of being a nurse (Cavanagh, 2001). There are many ways to prevent foot complications, the most important being to keep a steady blood glucose level within the therapeutical range (DiabetesUK, n. d. - a). This is key to prevent all diabetes complications and should be the first thing to inform the patient of. In addition to treating disease, the role of a nurse is to prevent it (Grimsbø et al., 2016). The nurse's preventative role must promote health by focusing on strengthening the patient's resources (Grimsbø et al., 2016).

The thesis focuses on the prevention of diabetic foot ulcers, a condition that can be extremely painful and affect the patient's quality of life (NHI, 2020). Foot ulcers can also lead to amputation, which is a fatal procedure increasing the mortality rate (Scain et al., 2018). By utilizing Orem's theory of preventative nursing, foot ulcers should be prevented before they appear, to avoid having to perform long-term wound care. Wound care can hurt, take time and cause distress in the patients, as diabetic foot ulcers usually take a long period of time to heal, if they heal at all (Foster & Edmonds, 2011, p. 84). Small interventions that one can perform within a couple of minutes can save the patient from a potential lifetime of distress, therefore the implementation of preventative measures is important. The participants in the

studies where educational interventions were used to equip patients with knowledge necessary to perform preventative care had a reduction in the appearance of risk factors to the diabetic foot (Fan et al., 2013, Nguyen et al., 2019).

To be able to prevent foot complications, the nurse must have updated knowledge of diabetes, diabetes foot complications and the patient's medical history. One of Orem's functions of nurses is "teaching another (Cavanagh, 2001)" includes the action of ensuring the patient has knowledge correct, up-to-date information. One must not give out information when one is not updated on the subject, or if one is unsure of the facts, as this might have the opposite effect of preventative work and can cause harm to the patient. The nurse will not be able to prevent complications of diabetes if they have not understood the cause of it. Nurses must possess and provide information to enable the patient to make decisions regarding their own health condition (Pasient- og brukerrettighetsloven, 1999, §3-2) which can also be found in the Norwegian ethical guidelines for nurses, (NSF, 2011) and ensure that the information is understood.

In the situations where the aim is to teach the patient self-care of the diabetic foot, one must help the patient understand the preventative work and why and how it is done (Nguyen et al., 2019). If nurses can use their preventative function to teach the patients to take part in the work, less time and resources are needed, and the patient does not have to be dependent on someone else to stay healthy.

5.2 Knowledge and Information

When a patient is diagnosed, it is likely that they will receive a lot of information within the first few days post-diagnosis. The patient is not likely to remember all of this, and therefore information should be given repeatedly, in the correct format and time. The articles showed that the participants possessed little knowledge of the disease and care of it prior to the interventions (Ramirez-Perdomo et al., 2019, Policarpo et al., 2014). This suggests that they had not received proper information from health personnel. Orem's nursing function "Guiding others (Cavanagh, 2001)" includes presenting the patients with information. It is also the responsibility of nurses to provide information as the patients are entitled to necessary information as stated in the Norwegian Patients' Rights Act §3-2.

A low level of knowledge was linked to a correspondingly low level of education amongst the participants (Ramirez-Perdomo et al., 2019, Scain et al., 2018). Nurses should identify the patients' needs and adjust the information thereafter (Eide & Eide, 2017). If the information is given in groups, one must arrange the participants after needs, and how well they are able to understand the information. One must perform proper communication to ensure that the patient both receives the information and understands it (Policarpo et al., 2014).

Professional communication with the purpose of providing patients with information (Fjørtoft, 2019) is essential when giving out health information based on the situation and needs of the patient (Eide & Eide, 2017, p. 18). Communication is not one-sided and requires the counterpart to take part in the dialogue. Nurses must be open for questions and prospective doubts and should be available if the patient has questions at a later point (Scain et al., 2018). If one does not know the answer to a question, one must be honest and tell the patient, as this openness will strengthen the trust between them (Fjørtoft, 2019), while dishonesty will cause distrust and complication.

Having respectful dialogues and giving correct and necessary information to the patient can lead to a relationship between nurse and patient built on trust (Fjørtoft, 2019, p. 76). Trust in the nurse and information will enable the patient to trust themselves to perform the care, and can function as a motivating factor (Fjørtoft, 2019, p. 76). Without trusting themselves they will not feel safe while performing their own care, which can lead to uncertainties during the care, or the complete avoidance of it. When a patient has the competence to perform self-care it can help them feel safe in their own home and can lead them to take control of the disease and care of it (Fjørtoft, 2019, Grimsbø et al., 2016).

According to Orem, the self-care requisites must be fulfilled for the self-care to promote human functions and health (Orem, 1995, p. 189) and this can only be done with sufficient knowledge. Patients must obtain knowledge of risk factors to the diabetic foot (Bjerva et al., 2006, Ramirez-Perdomo et al., 2019, Policarpo et al., 2014). They must know what to look out for and when to report it to a professional. The patient is the one that observes the foot regularly and should know when to take appropriate actions and measures. Common risk factors such as dry skin, cracked skin and calluses (Nguyen et al., 2019) must be specifically informed of, as they are easy to observe and treat. The patients must receive proper educational interventions on how to take care of their own feet (Scain et al., 2018, Fan et al.,

2013, Nguyen et al., 2019). This must include cleaning, drying, moisturizing, massaging (Policarpo et al., 2014) and what footwear to use, as many foot ulcers are caused by improper footwear (APMA, n. d.). After receiving and understanding this information, the patients should be able to take care of their own feet at home, if they have the motivation to do so.

5.3 Motivation and attitude towards Self-Care

Orem's classification of the function of nursing states that it is the nurse's responsibility to aid the patient in performing self-care (Cavanagh, 2001). The function "providing an environment promoting personal development in relation to meet future demands (Cavanagh, 2001)" can be understood as facilitating self-care to limit the personnel needed for these tasks in the growing group of patients who receive nursing in their own homes. As previously described, the patients require knowledge and information to be able to perform self-care, but they also need the motivation and attitude to do so (Policarpo et al., 2014). The correct attitude and behaviour can be altered by providing information, and describing the risk factors and what complications these can cause (Scain et al., 2018, Nguyen et al., 2019). If the goal of maintaining their own health is not enough for the patient, the description and possibly photos of eventual complications may further motivate the patient. This is a tool one must be cautious with as it can also demotivate the patient making them unreceptive to further information.

Diabetes is a disease that requires motivation in order to take care for oneself. The disease demands daily activities including staying active, eating healthy, blood glucose tests and foot care (Scain et al., 2018). If the motivation is not present, one cannot expect the patient to remain healthy without continuous help from health professionals. Nurses should always be updated on the current health condition of the patient, the state of the foot and the attitude towards self-care. If the patient loses the motivation and concludes the self-care without the nurses' knowledge, it can have severe consequences as ulcers can develop rapidly (Foster & Edmonds, 2011). Assuring the patient that one can contact a nurse if needed, is important in preventing these setbacks, and can provide the patient with safety in the knowledge that there is a fallback plan.

Some may be of the opinion that care of the sick is the responsibility of the nurses, and fail to see that self-care can lead to being in control over one's life again. Orem describes nursing as "when a nurse performs actions to help someone with a target to achieve the best possible results (Cavanagh, 2001)". The best possible results vary according to the individual patient. If the patient has potential to be self-sufficient, then the target for the care is to help the patient with this. If the patient is not in a good enough condition to become self-sufficient, the nurse must help the patient prevent further setbacks, this can for example be the care of the diabetic foot.

The freedom of being self-reliant can be the greatest motivator to perform self-care. Not having to rely on someone else to come to your house to help you or having to be home at exact times to receive this help, can free up the patient's day and boost their confidence. Taking care of oneself is a most fundamental need and the lack of ability to do so can be demotivating and can cause a feeling of helplessness. It is the responsibility of the nursing profession to help them prevent this from happening.

The goals for the performance of self-care should be individual and, they should be based on condition, motivation and attitude. Some patients may be able to perform all aspects of self-care themselves, while some may only be capable to perform parts of it, where nurses must compensate for them if needed (Fjørtoft, 2019, p. 65). The daily condition can also affect the ability to perform self-care, where some patients may need help one day, and be completely self-reliant the next. These patients must be taken just as seriously as the ones that require help every day. To be able to help them take care of themselves, nurses must help at the times they are too tired or too ill to help themselves, if not, nurses risk worsening the situation for both the patient and themselves, creating more work in the future.

5.4 Discussion of the Method

The discussion is a result of my analysis of the results. Others may perceive the results in a different manner, which would have led to a different discussion. The results are consequences of my method, the use of other methods could have led to a different result.

The methods that affect the results are the choice of databases, search terms and the inclusion and exclusion criteria. The databases I used were two large databases for health research, and they complement each other. I chose to use Cinahl and Pubmed as they are two highly recommended world-known databases for research within health and I have previously used these without problems. If I had utilized other databases, I could potentially have found additional articles and research from other countries, but I chose not to, as I found sufficient information from Pubmed and Cinahl.

The studies were done in countries with a differing status as regards to economic and educational development, which can have an effect on the research results. Two of the articles were from Canada and Australia, which are countries with similar culture to Norway. The three remaining articles were from Brazil and Colombia, which may have impacted the results. This is important to take into account, because different countries have different cultures and differ with regard to how they take care of people that are sick and different practices of health and laws concerning the patient's rights. I have chosen to include the research because the information had similar results to the research in Canada and Australia, which strengthens the results.

I have chosen to utilize research that only includes patients with Diabetes Mellitus type 2, because it is a disease that often occurs in adult age as the result of an unhealthy lifestyle. Many patients with Diabetes type 1 got the diagnosis while young and have grown up with a lifestyle fitting the disease, and therefore does not have to adjust their lifestyle choices in the way that patients with diabetes type 2 have to. Because this thesis is based on attitude and motivation towards self-care, I have chosen to include the patients who have to go through a change of lifestyle to accommodate for this.

5.5 The relevance of the thesis to the profession of nursing

The thesis is highly relevant to the profession of nursing as it is based upon the nurse's responsibility. The thesis; "What is the role of nurses in improving self-care for prevention of foot ulcers in patients with type 2 diabetes living in their own home?" will explain the work

tasks of a nurse and the results can be used to better the caregiving within the relevant group of patients.

Based on the results, nurses can take part in preventing foot ulcers amongst patients with diabetes by providing them with sufficient information. Nurses must take this responsibility seriously and have proper dialogues with their patients, answering questions and clarifying doubts. Ideally all patients should be offered practical hands-on-lessons to learn self-care techniques.

6.0 Conclusion

The aim of the thesis was to investigate how nurses can contribute in the prevention of diabetic foot ulcers when the patient is performing self-care. Research was found through literature searches and included based on inclusion and exclusion criteria. The participants from the research lacked knowledge on diabetes type 2, risk factors of it and how to perform self-care on the diabetic foot. The research showed that attitudes and behaviour changed when participants were exposed to educational interventions. The participants who received knowledge and a change of attitude through educational interventions had a reduced risk of complications to the diabetic foot. The preventative work to reduce risk factors can be seen in Orem's theory of nursing where she highlights the importance of preventative work. According to Orem, nurses must focus on the healthy and not only the sick and by treating foot risk factors to prevent foot ulcers, we are focusing on the healthy foot before it becomes sick. The research shows promising results, but there is need for more long-term research to follow up patients in order to gauge whether self-care becomes a daily routine, or if there is only a short-term effect from the educational interventions. Nonetheless, the studies show a promising effect in providing the correct information in an appropriate manner, adjusted to the individual needs of the patient in accordance to Orem's theory of preventative nursing.

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8.0 Appendix

Diagram 1: Flow chart Exclusions of Articles

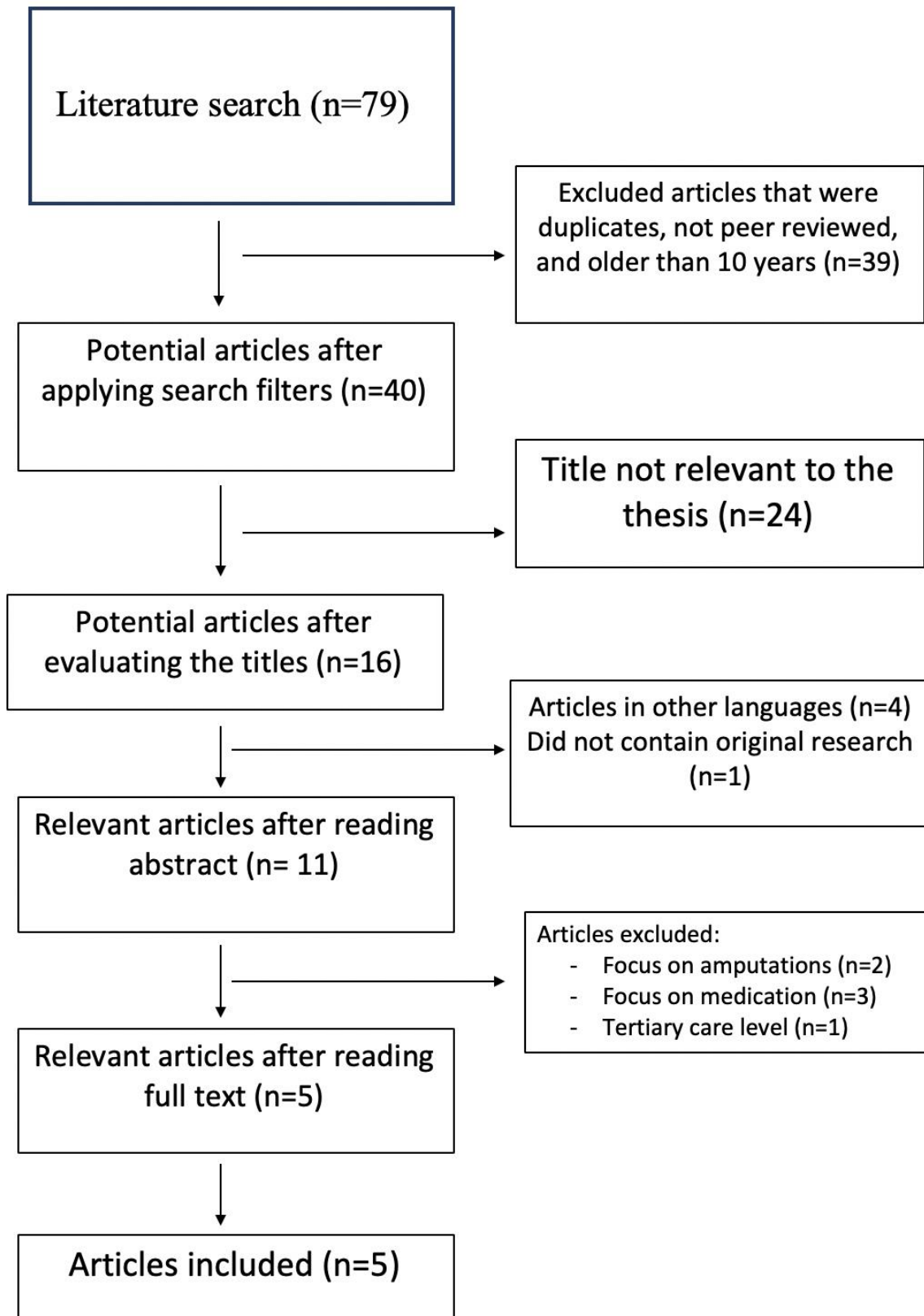


Table 1: PICO, MeSH terms and keywords

Patient/Problem	Intervention	Comparison	Outcomes
Patients diagnosed with Diabetes Mellitus Type 2 who receives home health nursing	The prevention of diabetic foot ulcers		Knowledge about diabetes and the complications of it to better the understanding of the disease and causing improved self-care and preventative care.
MeSH terms:	"Diabetes Mellitus type 2", "Diabetic Foot", "Foot Ulcer", "Nursing", "Aged" and "Self Care"		
Keywords:	"Prevention" and "Home care Nursing".		

Table 2: Literature search Pubmed

Database: Pubmed			
Date of search: 27/03/2020			
Number	Search terms	Combinations	Number of hits
S1	Prevention		1 735 266
S2	Foot Ulcer		13 482
S3		S1 + S2	2 249
S4	Home Care Nursing		728 039
S5		S3 + S4	302
S6	Type 2 Diabetes		178 352
S7		S5 + S6	41
S8	Aged		5 361 065
S9		S7 + S8	28

Table 3: Literature search Cinahl

Database: Cinahl			
Date of search: 30/03/2020			
Number	Search terms	Combinations	Number of hits
S1	Diabetes Mellitus, type 2		63 568
S2	Prevention		701 056
S3		S1 + S2	12 513
S4	Diabetic Foot		9 452
S5		S3 + S4	228
S6	Self Care		54 243
S7		S5 + S6	51

Table 4: Literature Information pp. 42-44

Authors, year, country	Aim	Method	Population	Quality	Ethics
Nguyen, T. P. L., Edwards, H., Do, T. N. D., Finlayson, K. 2019 Australia and Vietnam	“Evaluate effectiveness of a theory-based foot care education program in improving foot-self-care and foot risk factors for ulceration in people with diabetes type 2”	A controlled study with the participants divided into a control group and an intervention group	119 participants from a health care centre in Vietnam, diagnosed with diabetes type 2 which met the inclusion criteria.	Peer reviewed journal and ethically approved	Improved by the Research Ethics board at the University of Toronto. All participants had to approve of the research process and give a signed consent.
Ramirez-Perdomo, C., Perdomo-Romero, A., Rodriguez-Velez, M. 2019 Colombia	To obtain information about the level of knowledge and practices of diabetic foot prevention by people diagnosed with diabetes type 2.	Correlational and cross-sectional study. Data collection from the participants was used to evaluate the different aspects and was validated by experts on the subject	304 out of the 1402 users of the Cardiovascular Risk Program in the Neiva municipal in Colombia were obtained as a sample group.	Peer reviewed journal and ethically approved	Approved by the Ethics Committee of Surcolombiana University and the health institution where the research took place. The research was based on the ethical principles of autonomy, confidentiality, respect, charity and nonmaleficence.

Authors, year, country	Aim	Method	Population	Quality	Ethics
Scain, S. F., Franzen, E., Hirakata, V. H. 2018 Brazil	“Identify what changes in the feet that would be associated with demographic, clinical, biochemical and treatment characteristics and which would increase the risk of mortality.”	Data collected from the patients’ records from entry point including clinical history, gender and age. The patients received feet examinations in an educational program for prevention and treatment of diabetic foot.	918 patients diagnosed with diabetes type 2 at University hospital Rio Grande do Sul in Brazil.	Peer reviewed journal and ethically approved	Approved by the Ethics Committee of Hospital de Clínicas de Porto Alegre. The researcher in this study all signed a Research Use Statement to be able to access the data used for the research.
Fan, L., Sidani, S., Cooper- Braithwaite , A., Metcalf, K. 2013 Canada	To discover the effect of an educational intervention on self-care and the acceptability and feasibility of the intervention in the participants.	A 3-week intervention foot self-care. Baseline data collection prior to the intervention and at a 3-month follow up. Descriptive statistics were used to examine characteristics, acceptability and feasibility of the intervention.	70 eligible participants were chosen, with a diagnose of diabetes type 2 who had not received formal diabetes education, 56 of them completed the study.	Peer reviewed journal and ethically approved	Approved by both the Human Research Ethics Committee of the Queensland University of Technology and the Ethics Research Committee of University of Medicine and Pharmacy at Ho Chi Minh City.

Authors, year, country	Aim	Method	Population	Quality	Ethics
Policarpo, N. d. S., Moura, J. R. A., Júnior, E. B. d. M., Almeida, P. C. d., Macêdo, S. F. d., Silva, A. R. V. d. 2014 Brazil	“To identify the knowledge, attitudes and practices for the prevention of diabetic foot in patients with diabetes type 2”	A cross-sectional survey on knowledge, attitudes and practices for the prevention of diabetic foot.	85 patients with diabetes type 2 from two Family health units in Picos in Brazil	Peer reviewed journal and ethically approved	Approved by the Research Ethics Committee of the Universidade Federal do Piauí.

Table 5: Results pp. 45-46

Authors:	Knowledge	Information	Motivation & Attitude
Nguyen, T. P. L., Edwards, H., Do, T. N. D., Finlayson, K.	Basic knowledge of diabetic and foot self-care is shown to improve preventative foot-care behaviour, and the improvement of a patient's knowledge would cause an increase in their confidence in performing self-care	When patients received proper information through educational interventions improved the self-care behaviour significantly, whereas written materials did not provide enough information.	The attitude toward self-care improved amongst the participants in the intervention group. The study shows positive short-term outcomes in behaviour.
Ramirez-Perdomo, C., Perdomo-Romero, A., Rodriguez-Velez, M.	Low level of knowledge is a risk for developing foot complications. Less knowledge a participant had, the less likely he was to perform foot self-care. Low level of education negatively affects the ability to understand and process the disease and negatively impacts the quality of life.	Insufficient communication and diabetic foot prevention education from nurses negatively influence the level of knowledge.	Women were more likely to perform daily self-care practices.
Scain, S. F., Franzen, E., Hirakata, V. H.	The level of knowledge can vary based on level of education and should be taken into consideration when understanding patients with conditions that require self-care like diabetes.	The patients who received educative information and attended appointments with nurses had a reduced risk of dying, whereas the patients who had amputated a limb had the highest mortality rate. Nurses must provide information to improve knowledge, skills and attitude towards foot hygiene. Repeated educational interventions to clarify possible doubts. Available data has shown	The participants were possibly more likely to accept and take part in interventions if they had previously been exposed to educational interventions, and also more willing to change their habits. To change the participants behaviour and encourage self-care, educational interventions were used.

Authors:	Knowledge	Information	Motivation & Attitude
		that educational activities produces a change of attitude.	
Fan, L., Sidani, S., Cooper-Braithwaite, A., Metcalfe, K.	The patients received knowledge on how to perform foot self-care which resulted in reducing the risk factors of diabetic foot ulcers amongst the participants.	The participants benefited from receiving information in one-to-one meetings.	The participants were willing to use the intervention as a good method to prevent foot problems and felt that it was beneficial.
Policarpo, N. d. S., Moura, J. R. A., Júnior, E. B. d. M., Almeida, P. C. d., Macêdo, S. F. d., Silva, A. R. V. d.	49,4% of the participants did not have sufficient knowledge on how to perform correct foot hygiene or what to observe for. Men had better of knowledge of what footwear to use. Women had more knowledge and was more concerned with health and had a greater perception of the disease than men. Insufficient prior knowledge showed incorrect answers on the frequency and purpose of physical exams and inadequate practices.	Nurses has to provide information and enable active attitudes to the disease, and especially in the prevention of complications of the diabetic foot. Lack of knowledge can be caused by lack of information that should be provided by nurses and other professional health care workers. Proper dialogue is important to know if the patient understands the information that is given.	80% of the participants would engage in self-care foot practices to prevent complications if sufficient information was provided. Women were more likely to perform daily self-care practices. The participants were willing to follow the guidelines to prevent foot ulcers. Inadequate self-care despite positive attitude suggests a deficiency of previous knowledge.